

The Mid Atlantic Regional Earth Science Applications Center (RESAC)

University of Maryland, Geography Department
www.geog.umd.edu/resac Tel 301 405 3408

Overview

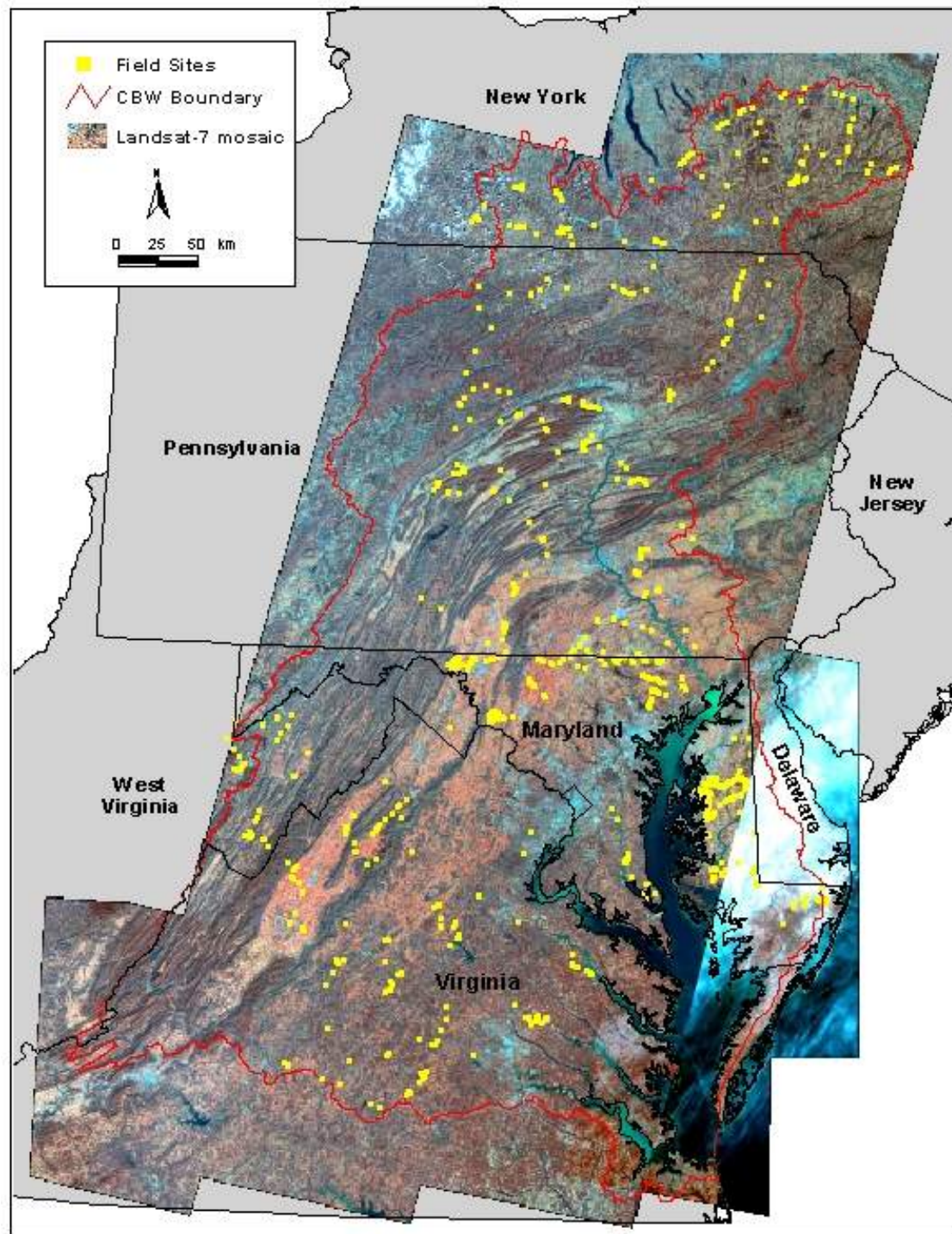
- One of 7 NASA RESACs nationwide
 - Centered at University of Maryland, College Park
 - Director, Manager, Liason, 1 Res. Scientist*
 - 4 Full-time Res. Assts, 8-10 Grad Students
- 40+ Partner organizations
- Study Area
 - Chesapeake Bay Watershed / Federal Region 3

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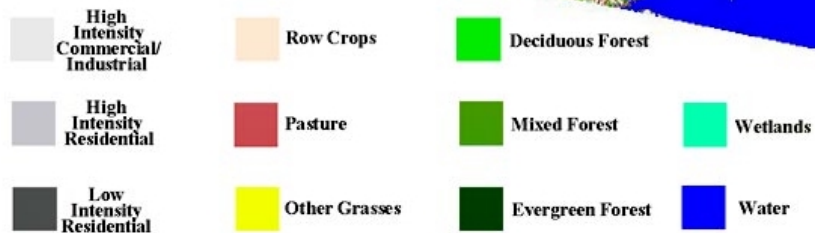
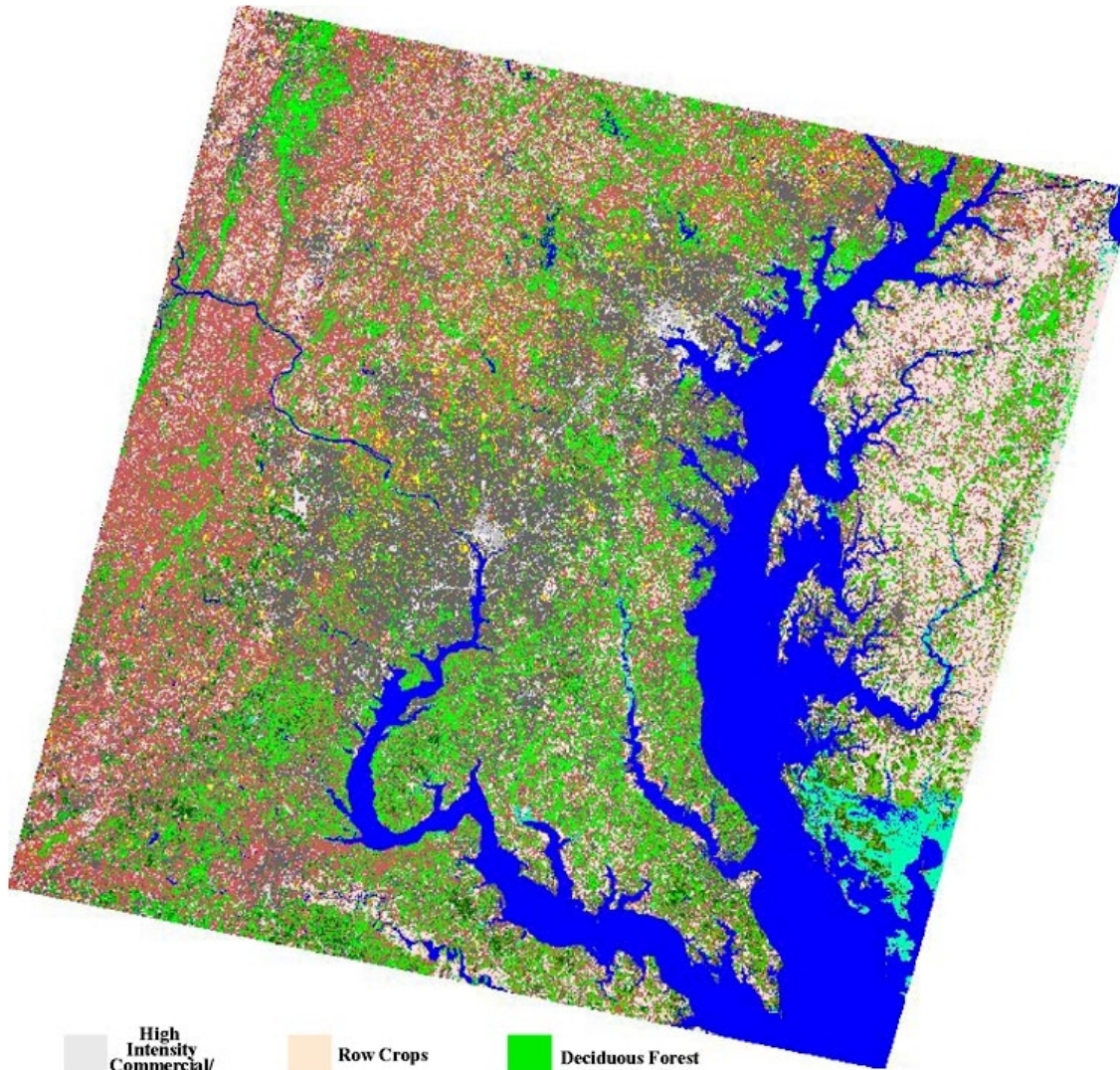
Objective: Improved Land Cover & Use Mapping, Monitoring and Modeling

- Current land cover / use
- Past land use change
- Modeling: Land use change, Chemical transport, NPP
- Demo Projects: Landscape Features and Properties
 - Crop cover, condition, productivity
 - Impervious surfaces
 - Forest cover & fragmentation
 - Riparian buffers
 - Wetlands



Chesapeake Bay Watershed Landsat7 Mosaic for Land Cover Classification

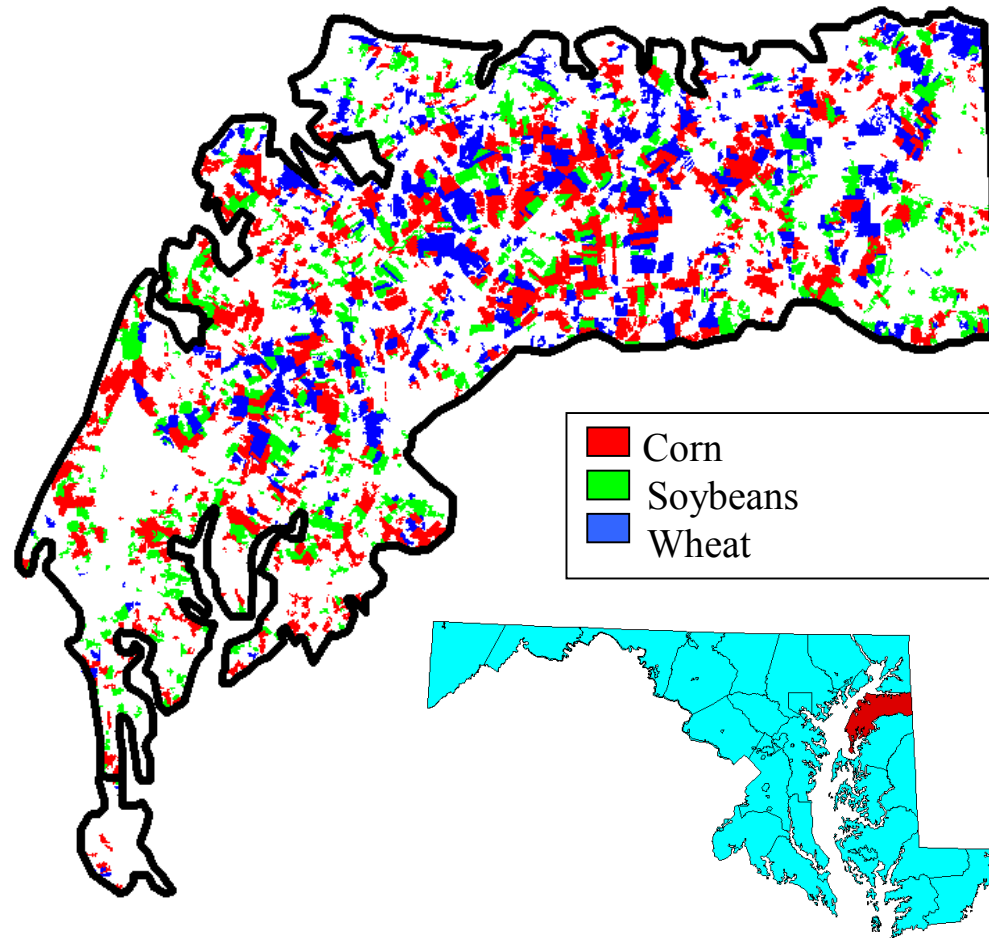
Land Cover Classification of path 15 row 33



Improved Discrimination of
land cover types:

- crops, grasslands & pasture
- residential densities

Crop Mapping with Multi-Temporal Landsat Imagery



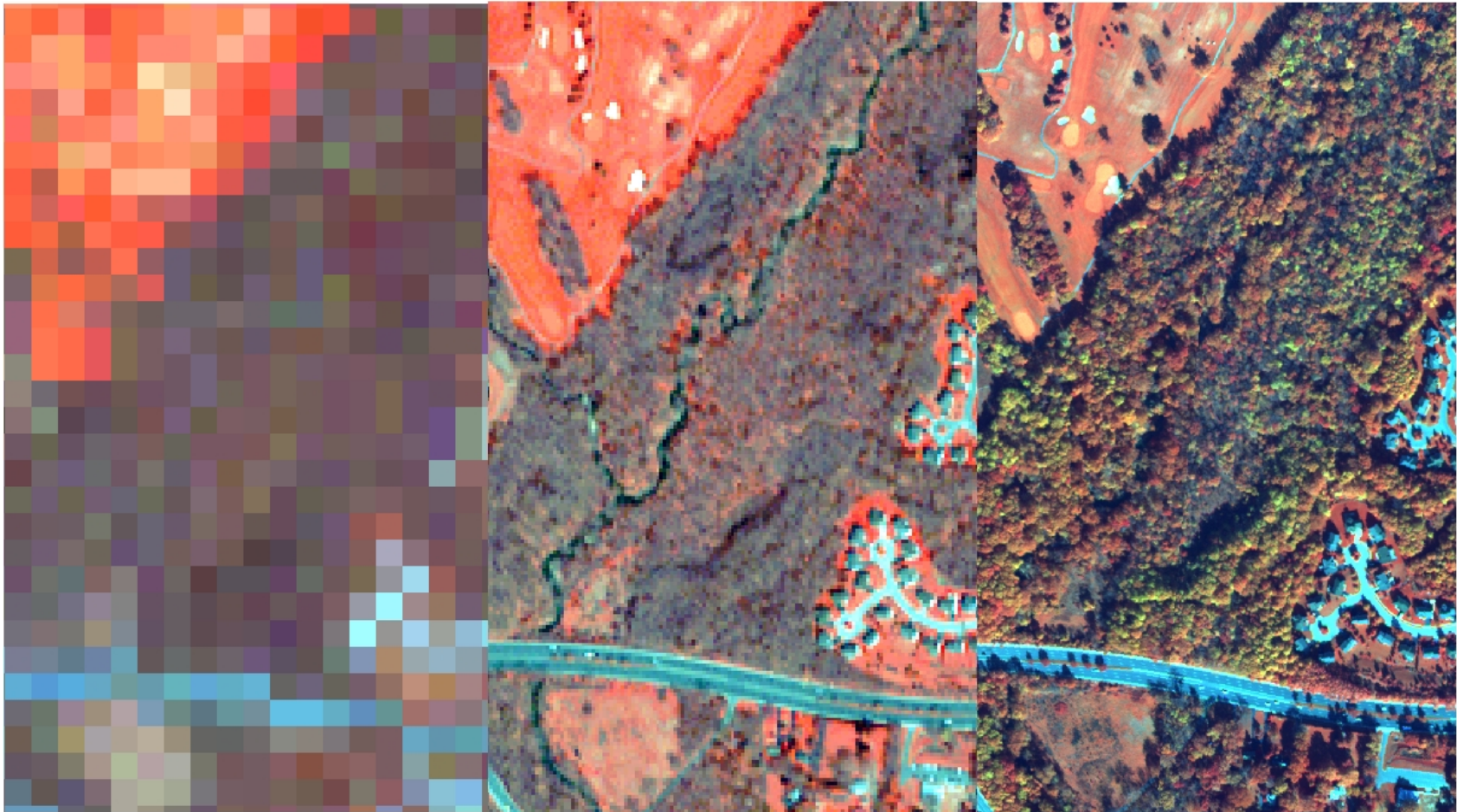
Kent County, Maryland 1998	Corn	Soybeans	Wheat
Acres from Satellite Map	35,468	37,218	20,730
Acres from Crop Statistics (NASS)	35,500	35,400	19,900

Multiple Sensors/Resolution

Landsat

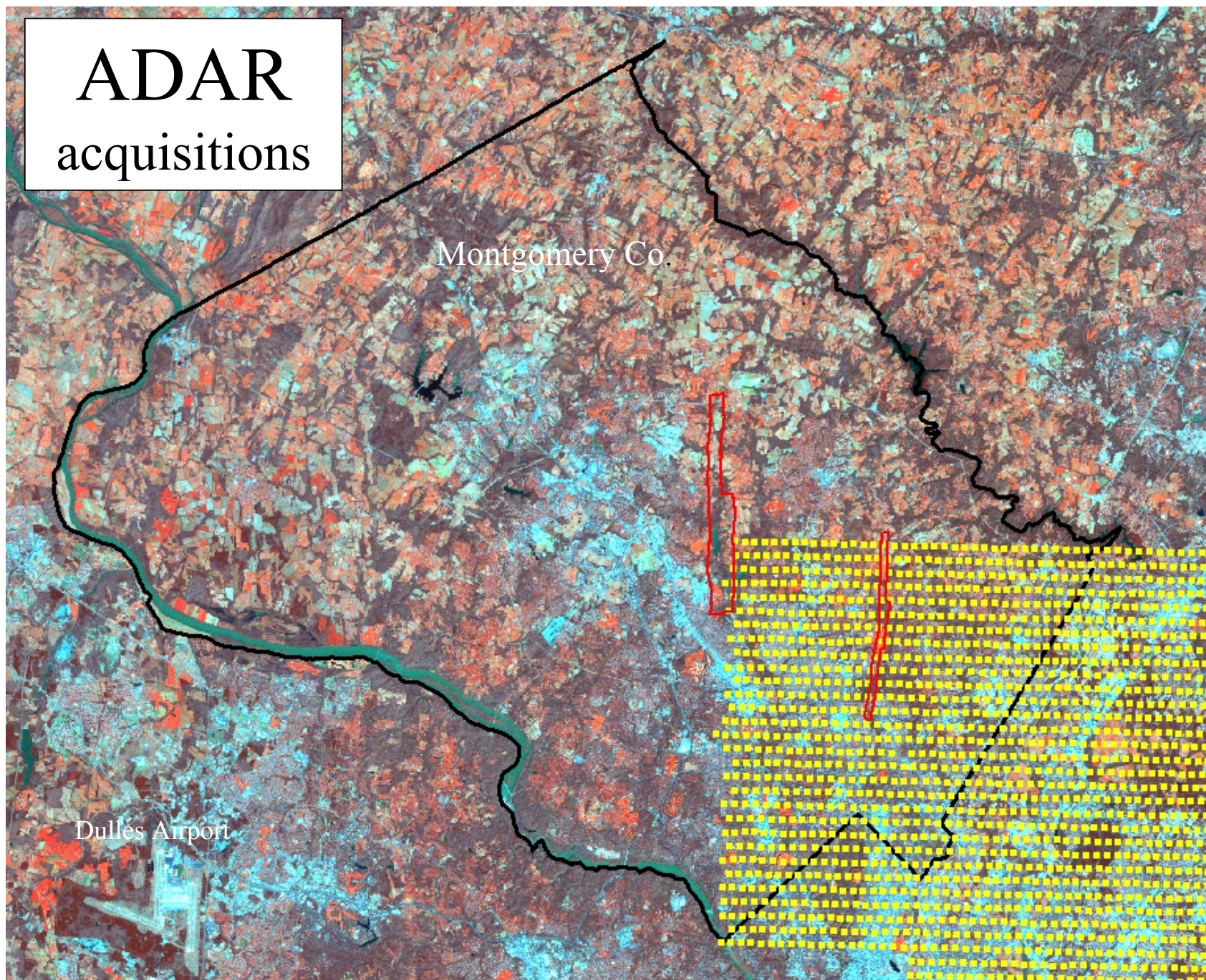
Ikonos

ADAR



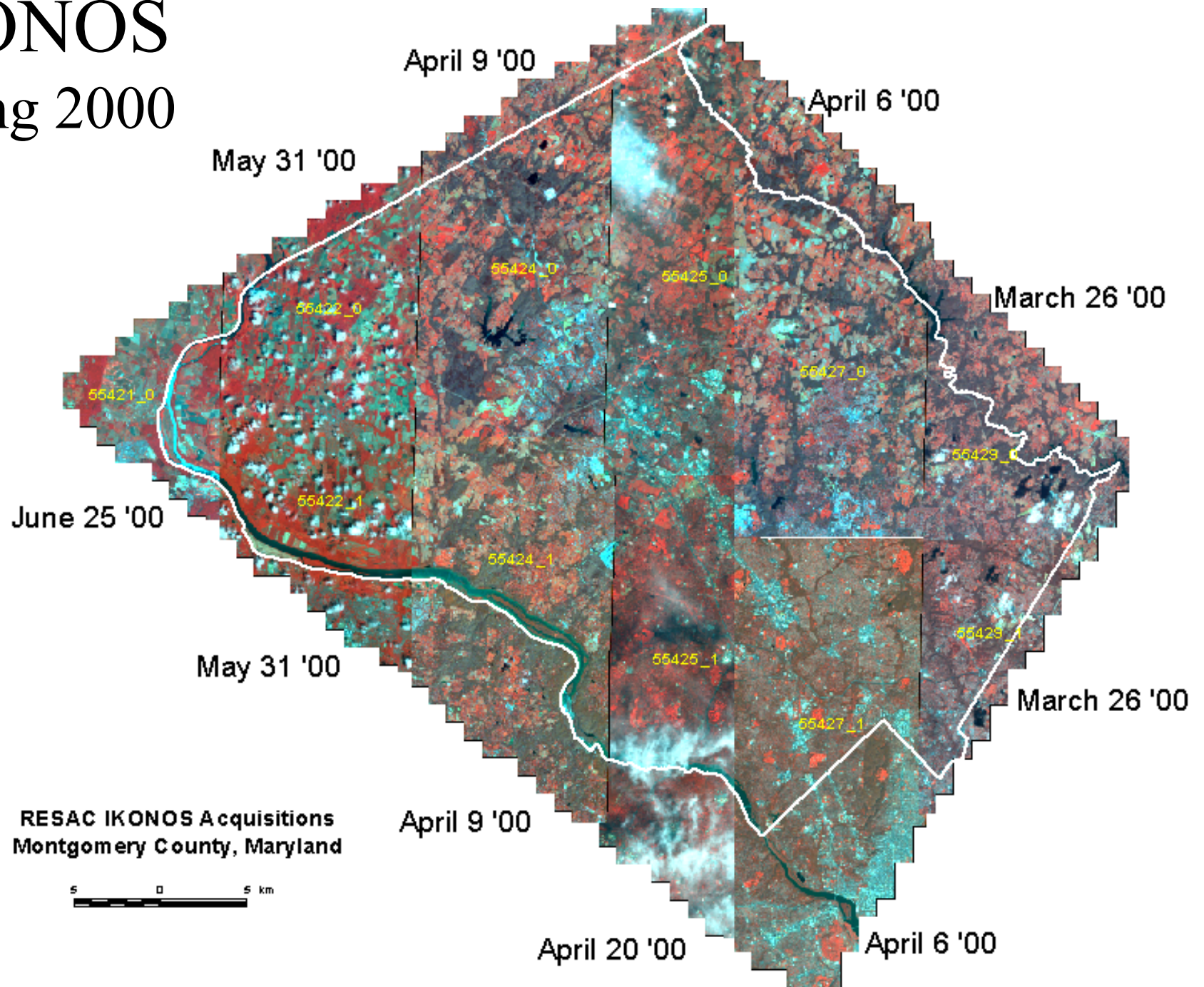
IKONOS & ADAR acquired through NASA SDP

ADAR acquisitions



IKONOS

Spring 2000

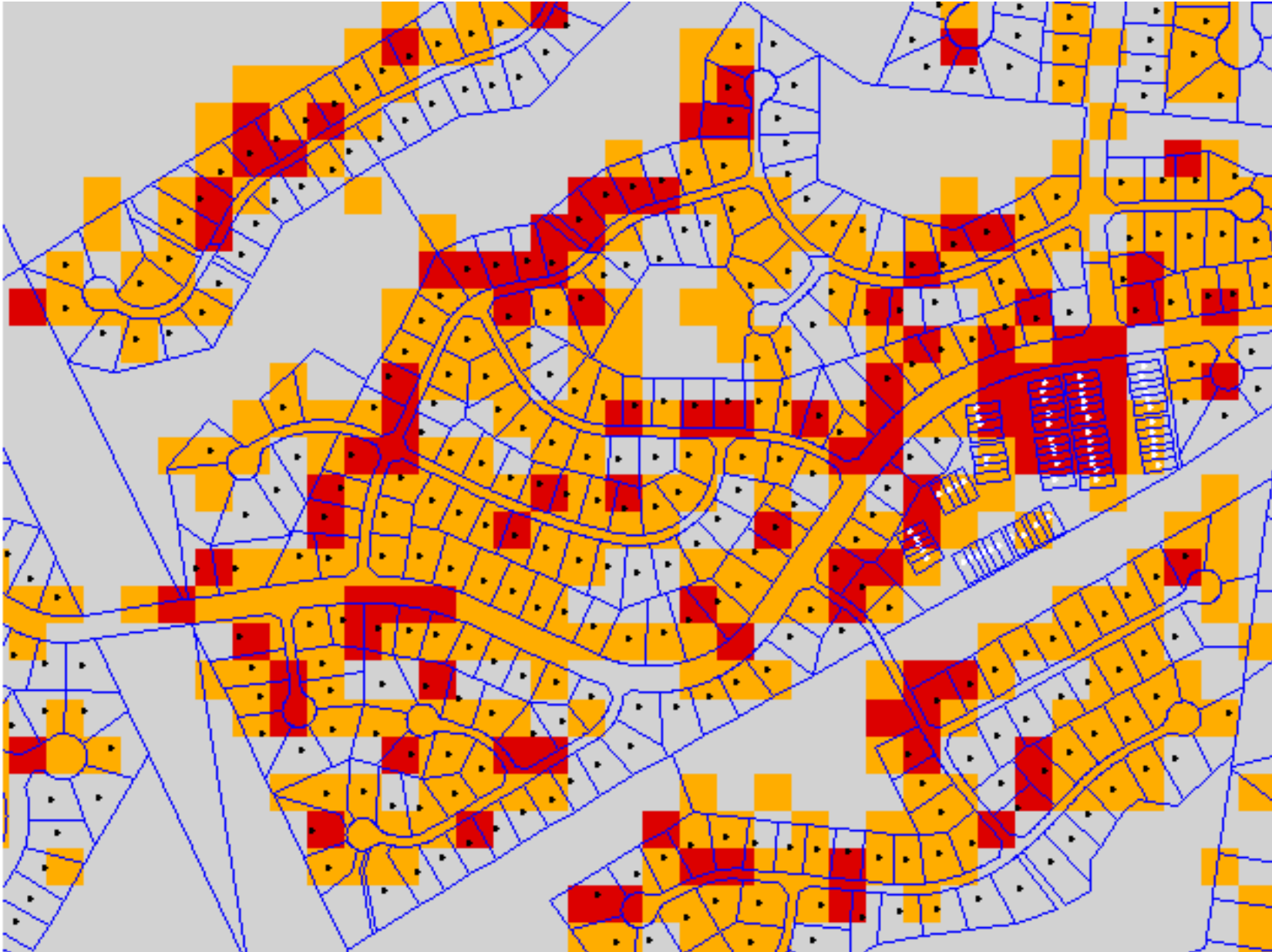




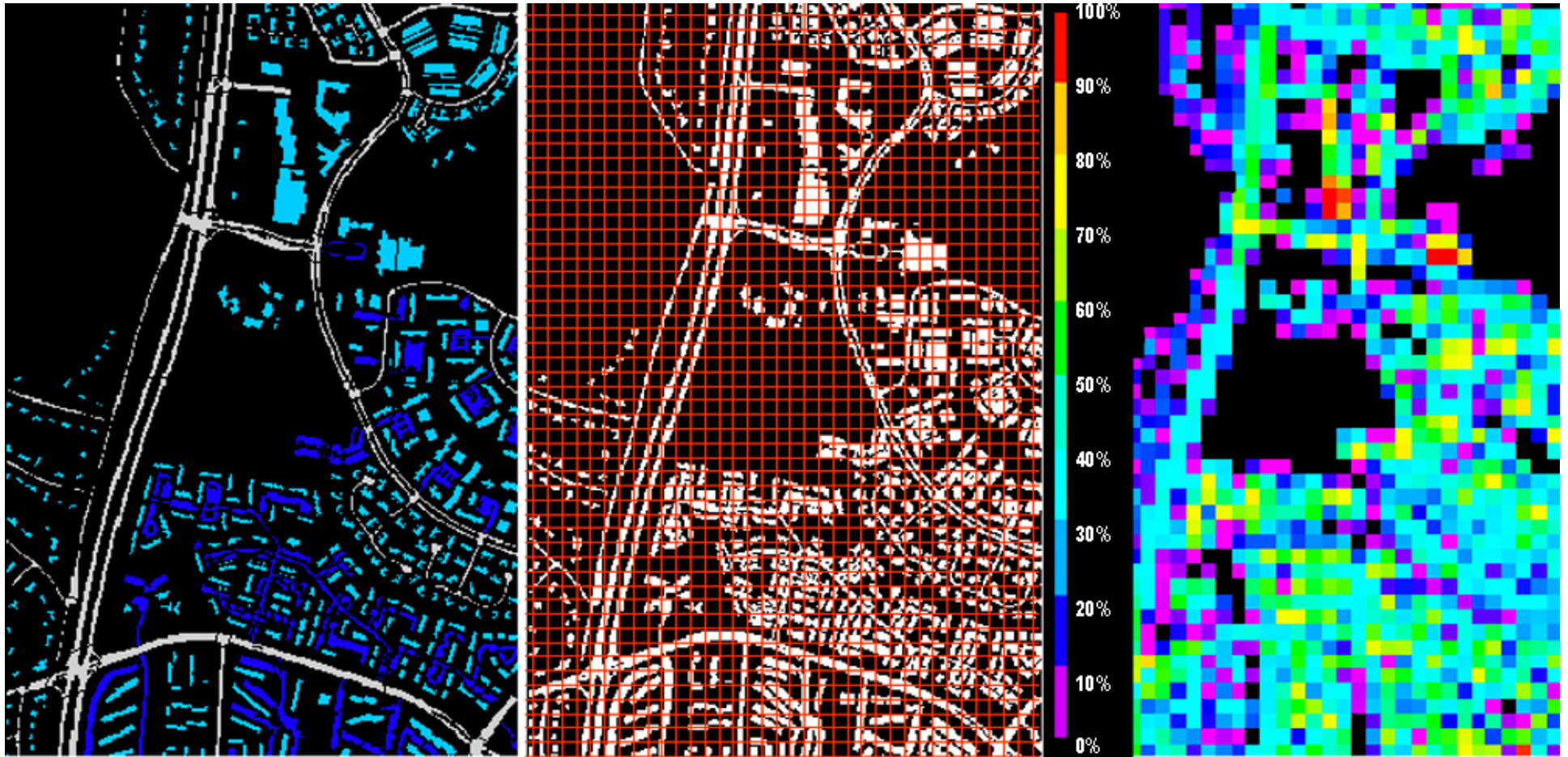
IKONOS, Property View & Parcel Data



Landsat Residential Density Mapping



Impervious Surface Area Mapping



Vector Extraction → 3m to 30m Grid → %Impervious Cover

GIS Processing Steps – Training Data

GIS Derived Impervious Surfaces

Montgomery County, MD



Washington D. C.

Classification Tree Derived Impervious Surfaces

Montgomery County, MD



Washington D. C.

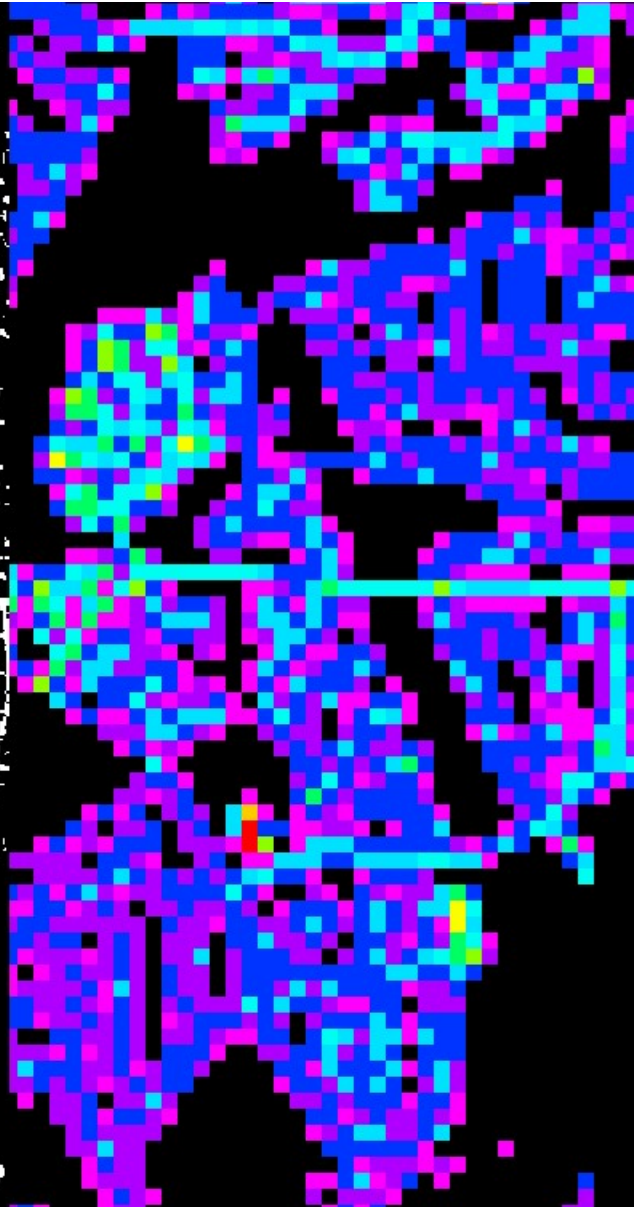
Impervious Surface Mapping



Ikonos 421

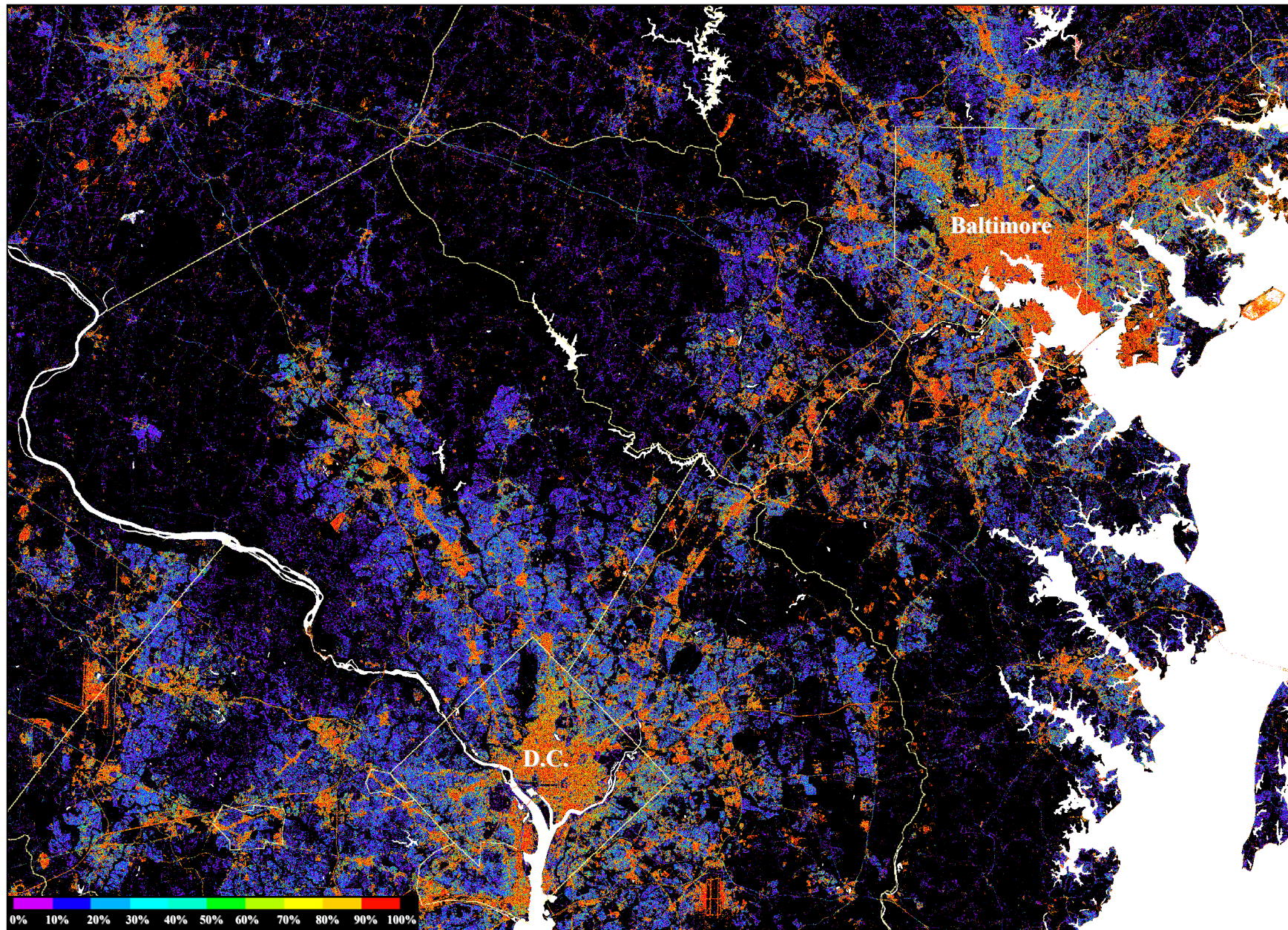


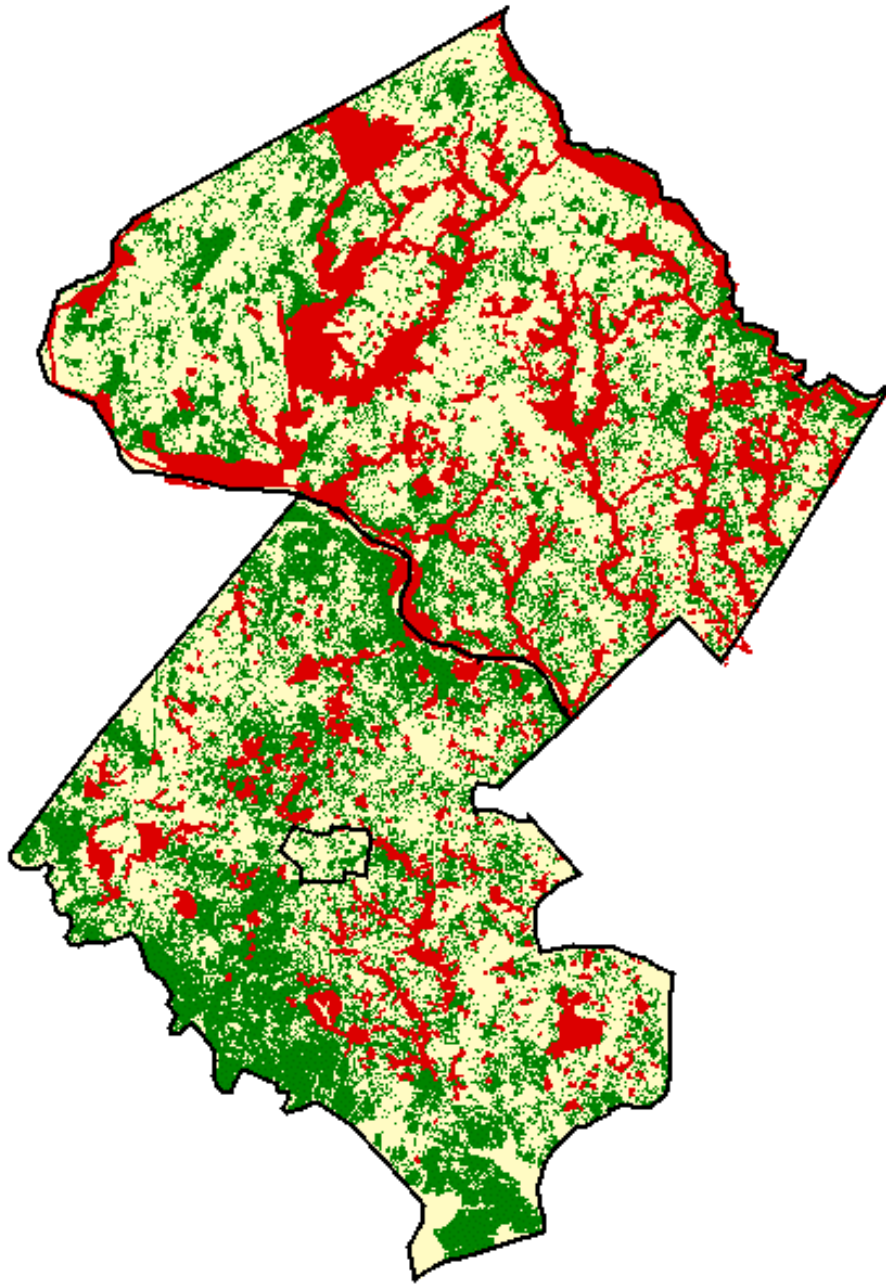
4m Ikonos map



30m Subpixel TM

Subpixel Impervious Surface Estimates for the Baltimore-Washington Metropolitan Area





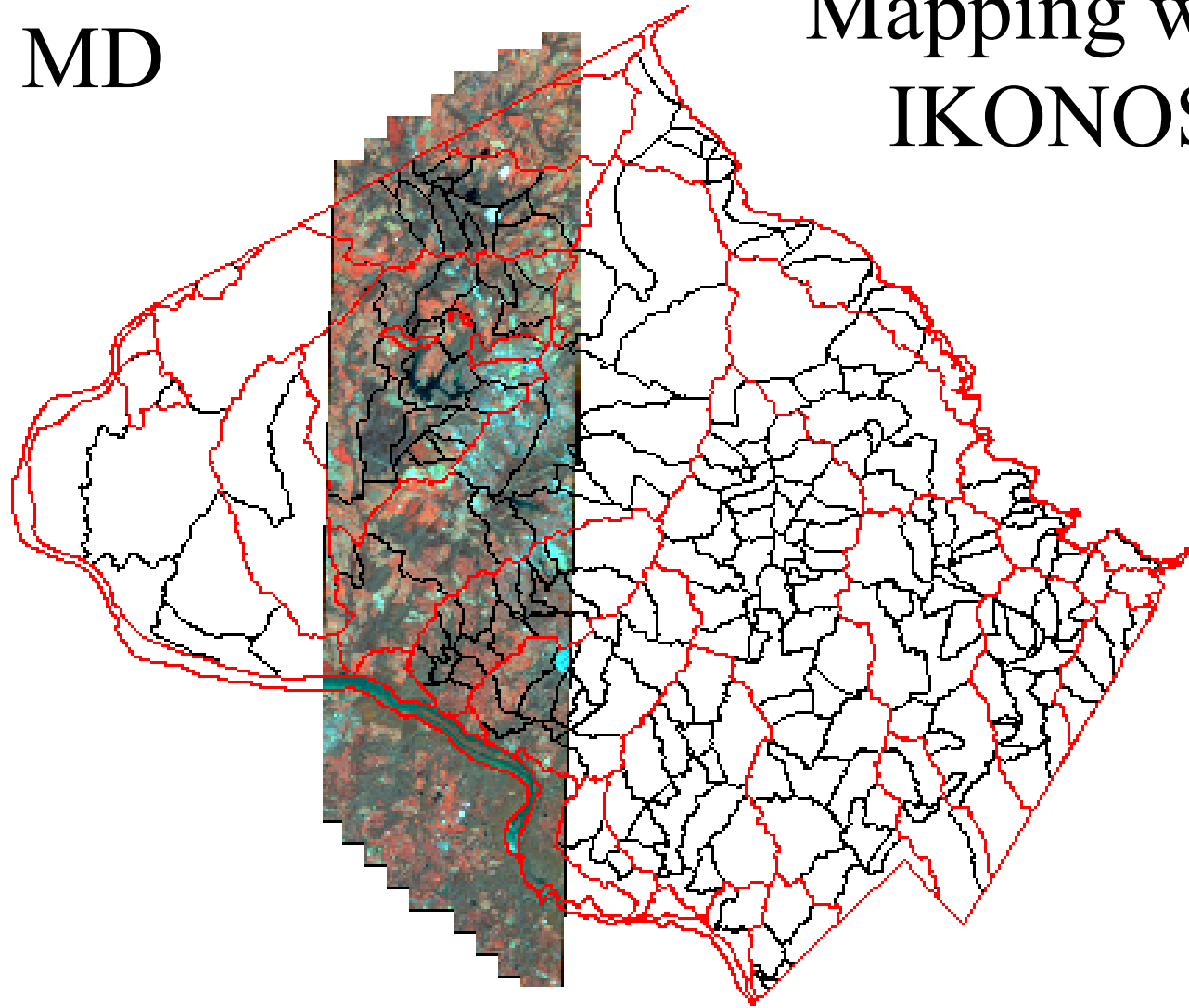
Forest Cover & Parks System in Montgomery and Fairfax counties

Riparian Forest Buffer Assessment

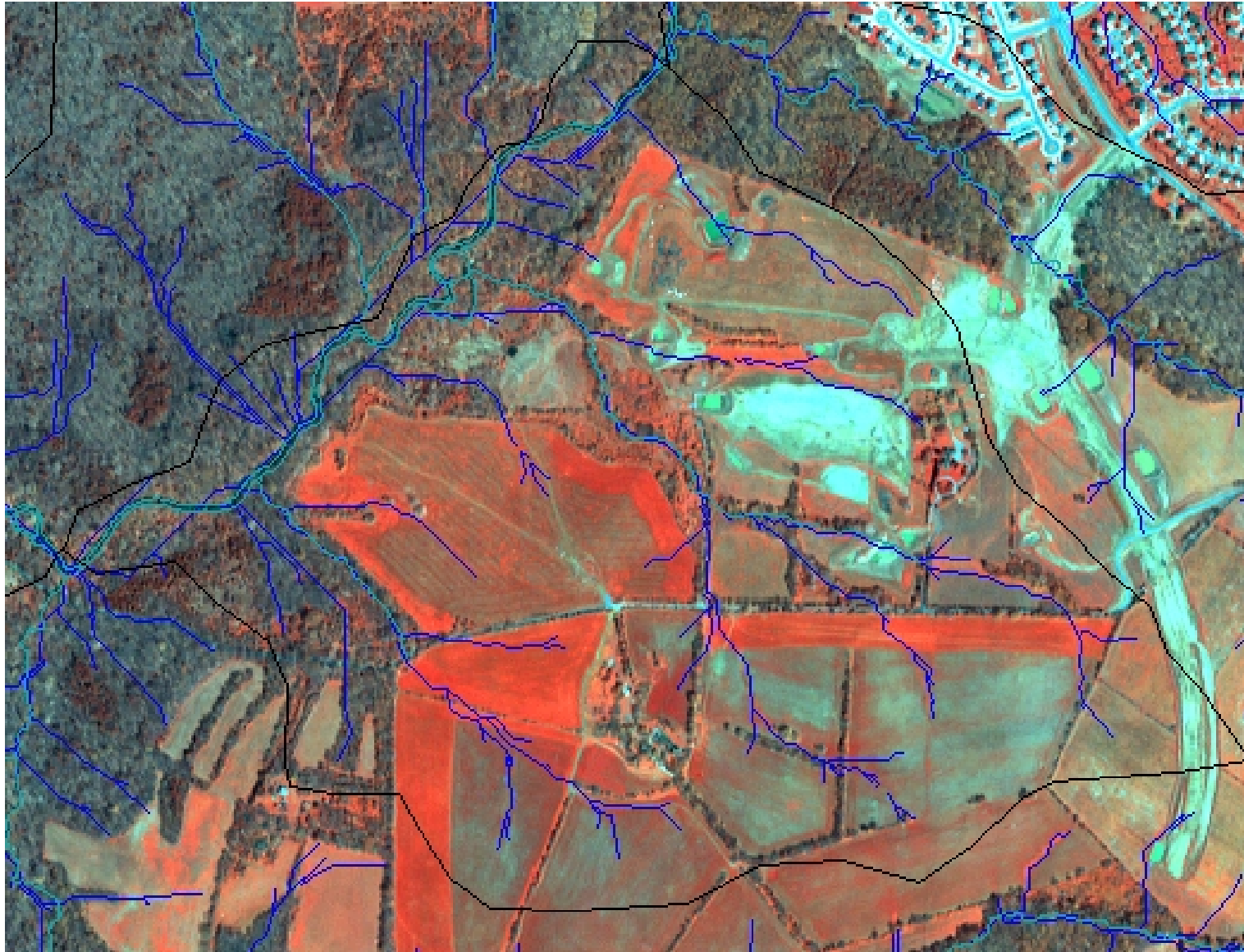


Montgomery
County, MD

Forest Buffer
Mapping with
IKONOS



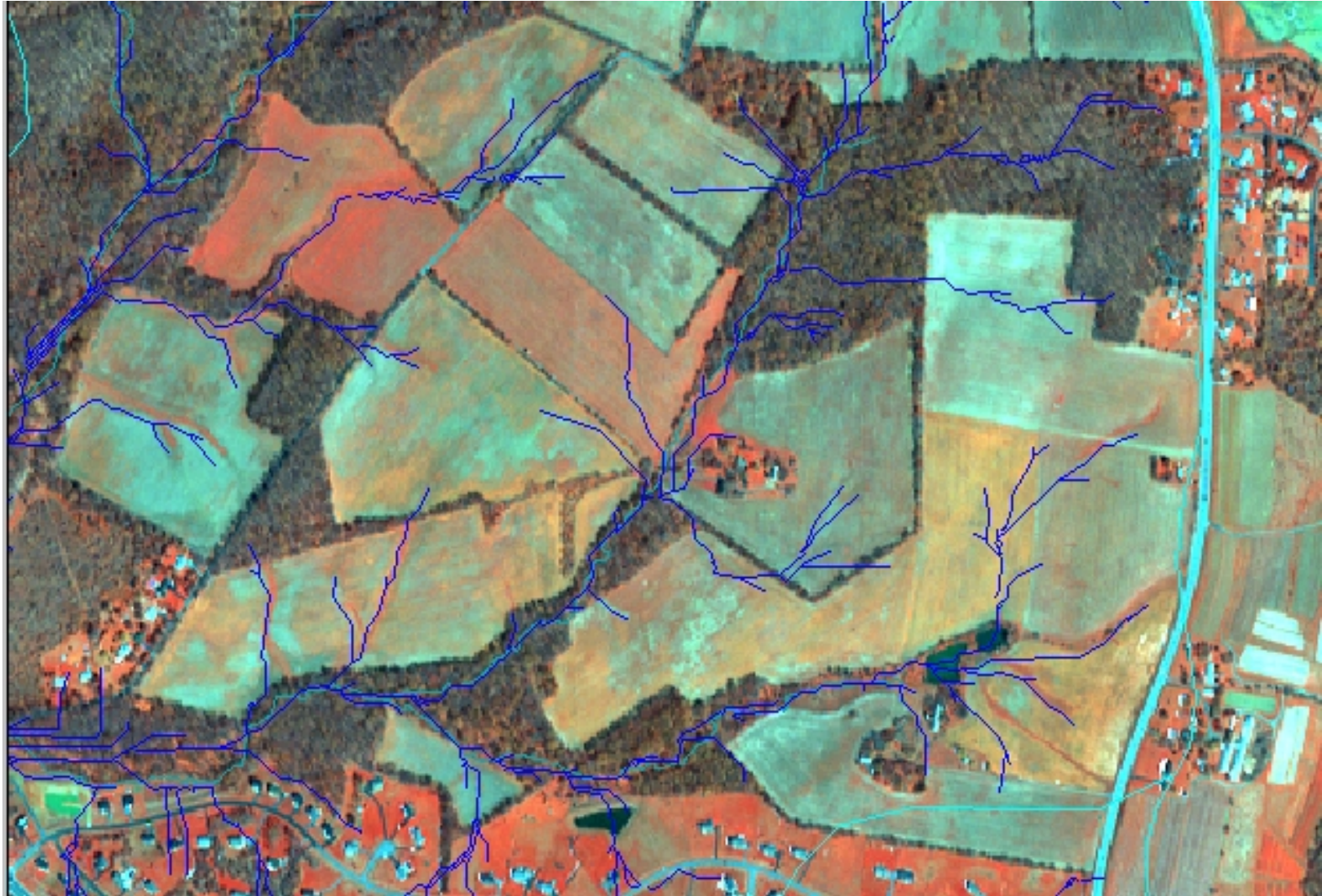
Land Fill Tributary Water Quality Rating: Poor

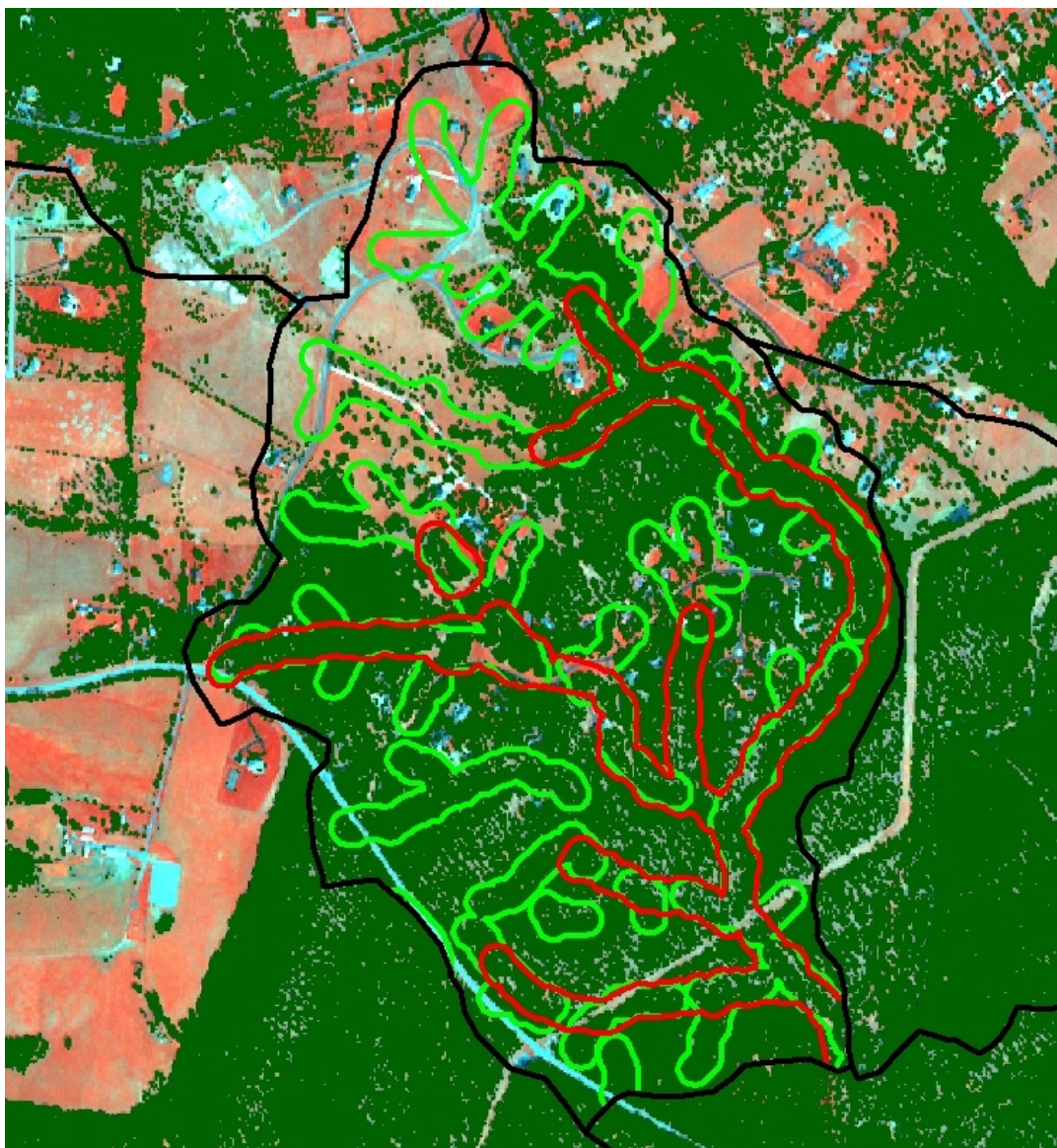


Mid-Atlantic
RESAC

Little Seneca Creek Water Quality

Rating: Excellent



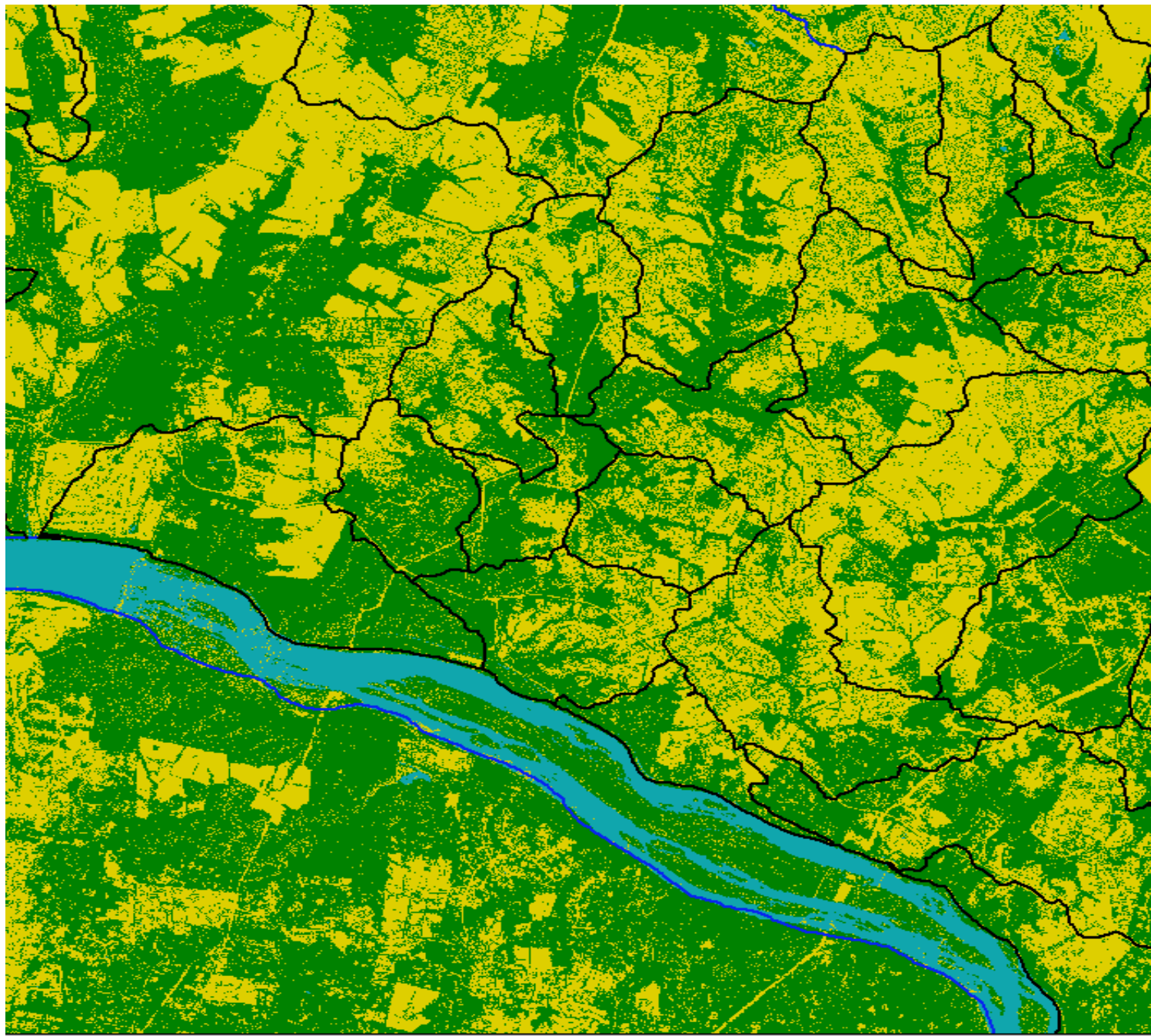


Reporting Statistics for Forested Riparian Buffers

Riverwood Area, Mont. Co
30m Buffer

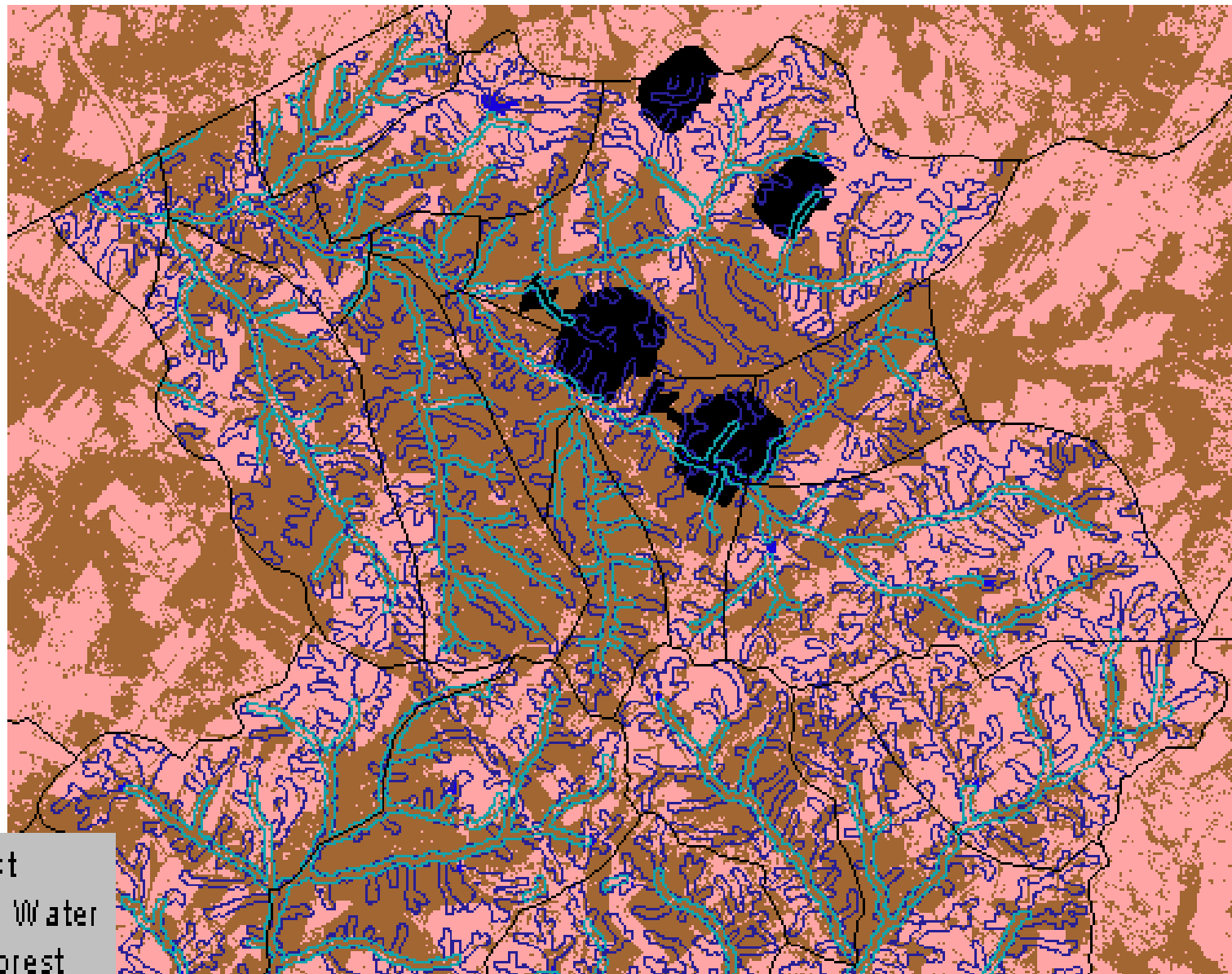
Current Hydro Layer
85% forested

Improved Hydro Layer
65% forested

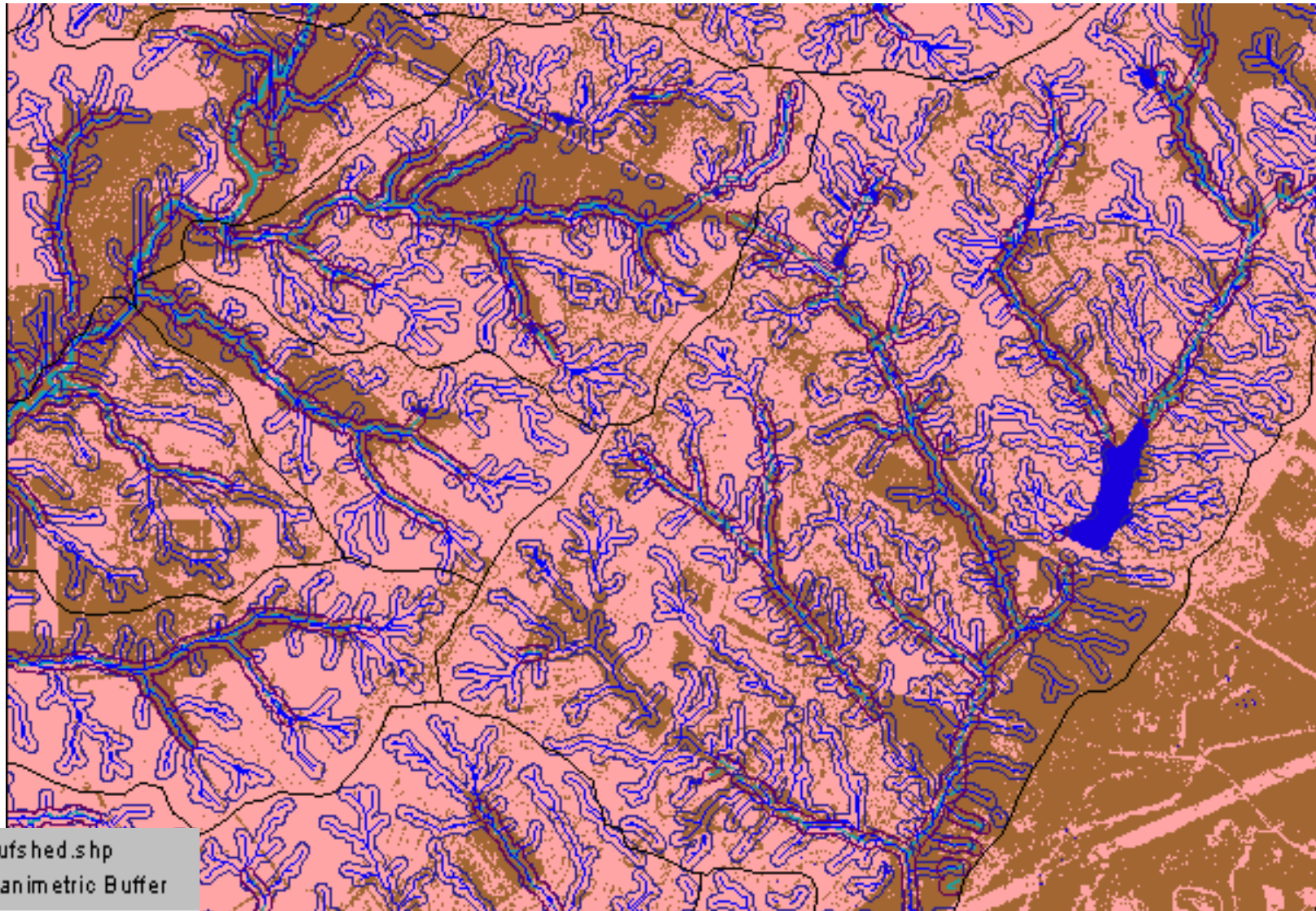


IKONOS Forest Cover Map

IKONOS Land Cover Classification



30 m Stream Buffers: Planimetric and DEM-derived



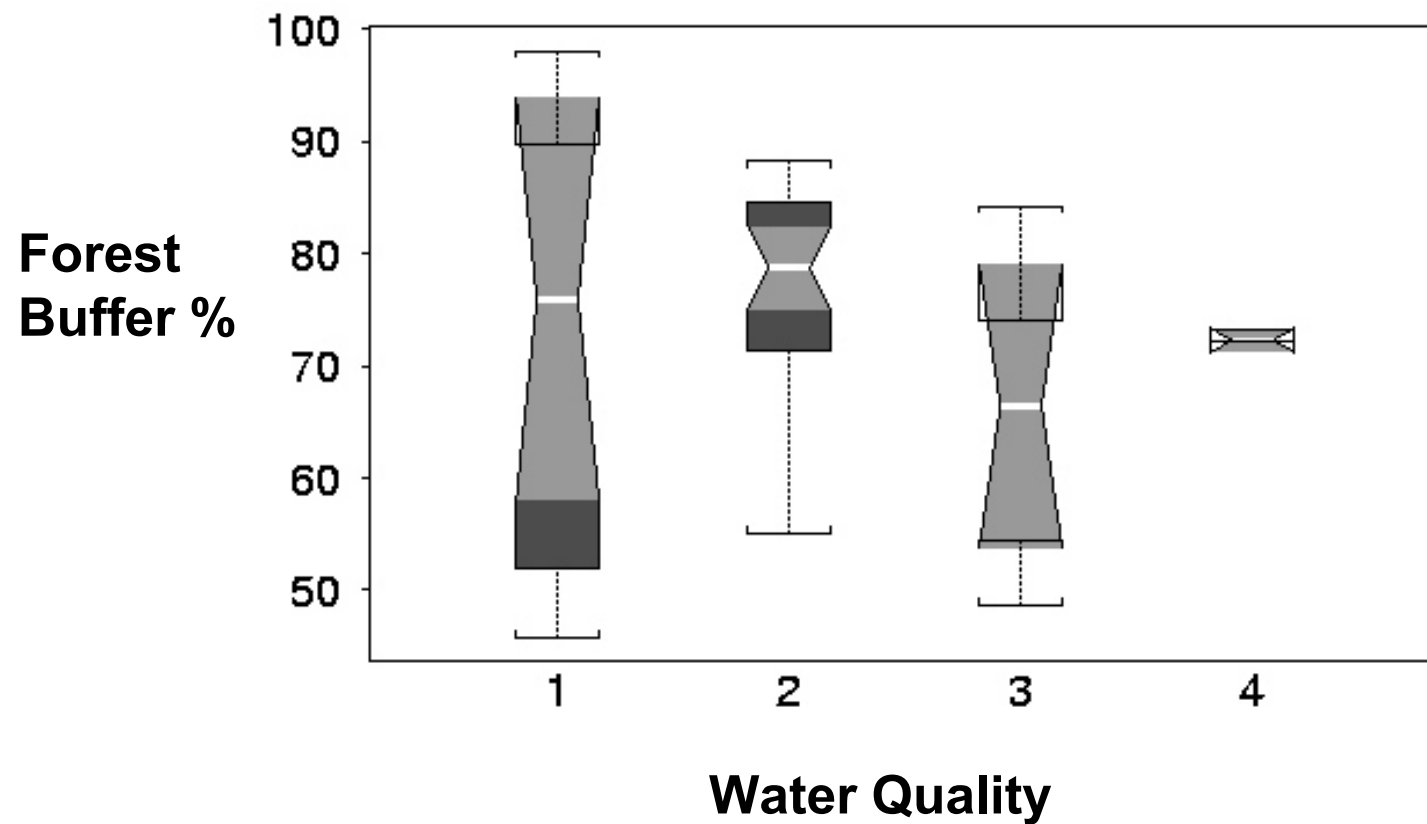
Hydrobufshed.shp

Planimetric Buffer

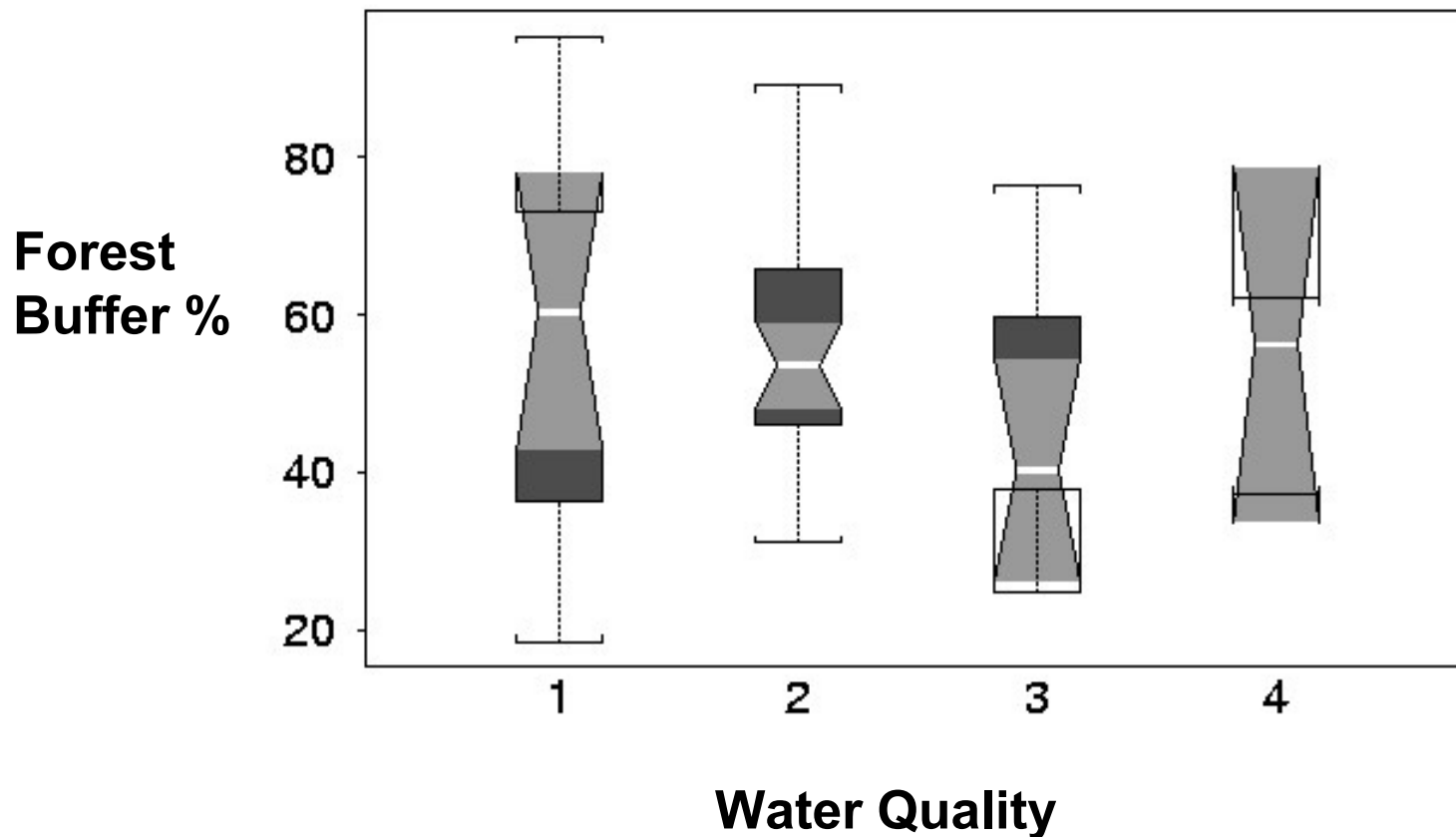
Demhydbufshed.shp

DEM-derived buffer

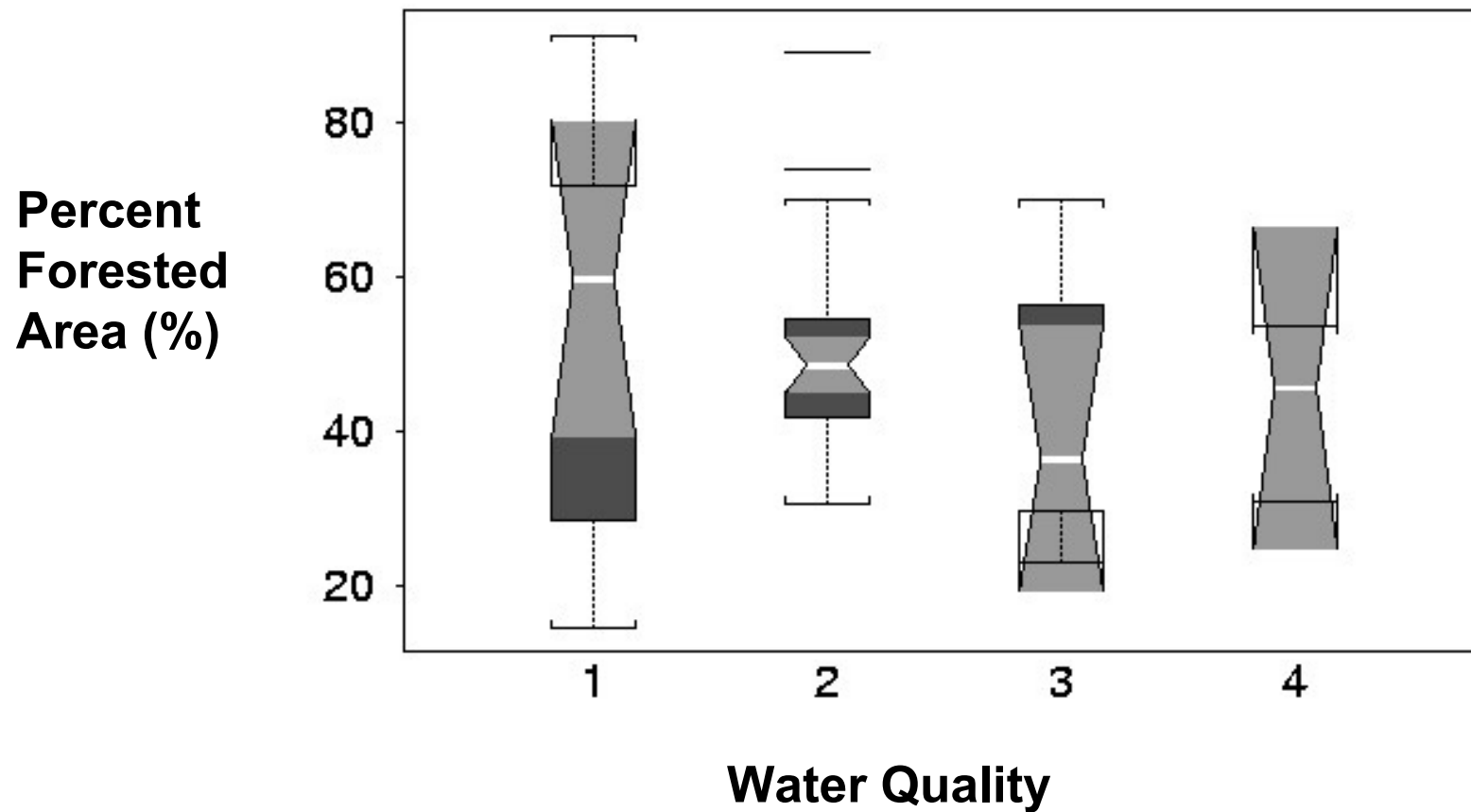
Forest Buffer Area and Water Quality (hydro)



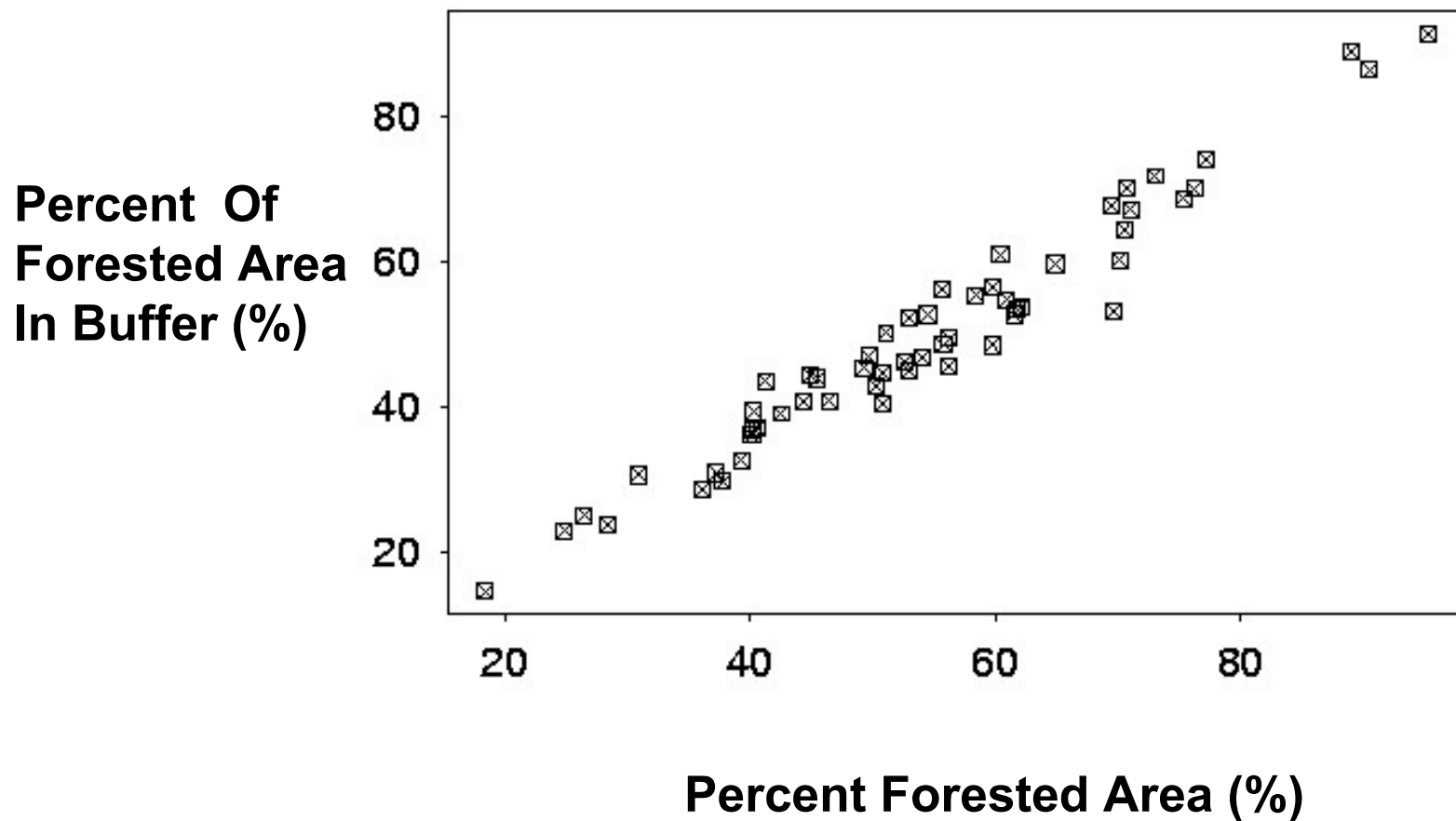
Forest Buffer Area and Water Quality (DEM)



Total Forest Area and Water Quality



Buffer Area vs Total Forest Area (DEM)



Conclusions

- Validation of TM scale LC analyses critical - well served by Ikonos.
- Ikonos imagery proving useful for riparian forested buffer, residential density and impervious surface mapping.
- Products are essential for local Gov for resource management - possibly replace / augment existing approaches (e.g., planimetric mapping).
- Ikonos provides valuable finer resolution data for mapping as well as for stream reach scale field work.
- Preliminary classification and analyses (with data collected at stream reach scale) suggest riparian buffers may improve water quality.

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RESAC Activities

- Satellite and aircraft data acquisition
- Geospatial data analyses using GIS
- Land cover and land use analyses

RESAC Services

- Facilitated Workshops
- Technological solutions for applications
- State and Local Governments
- Land Managers
- NGOs

RESAC and Geospatial Service Providers

- EarthSat Corp
- 3Di LLC
- Airborne-1
- EarthData Corp